****

AMERICAN CREOSOTE WORKS, INC.

CERCLA NPL SITE

OPERABLE UNIT ONE

Jackson, Madison County, Tennessee

****

FIVE-YEAR REVIEW

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PREPARED BY THE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

Atlanta, Georgia

January 25, 1995

****

DECLARATION

FOR THE

FIVE-YEAR REVIEW

SITE NAME AND LOCATION

American Creosote Works, Inc. CERCLA NPL Site
Jackson, Madison County, Tennessee

STATEMENT OF BASIS AND PURPOSE

This document presents the current conditions at the Site and makes recommendations regarding maintenance and site stabilization activities and future reviews. Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, requires that if a remedial action is taken that results in any hazardous substances, pollutants, or contaminants remaining at a site, the U.S. Environmental Protection Agency (USEPA) shall review such remedial action no less often than each five years after initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

ASSESSMENT OF THE SITE

The Site continues to be protective of human health and the environment. This document has been reviewed by USEPA Region IV, USEPA Headquarters, and the State of Tennessee. Upon approval of this document by the Division Director, Waste Management Division, USEPA Region IV, the USEPA will transmit this document to the Administrative Record for the Site. The USEPA will ensure that the Site remediation remains protective by conducting Five-Year Reviews in the future. The next review should be completed in 1999.

Approved by: _____ Date: 1/25/95

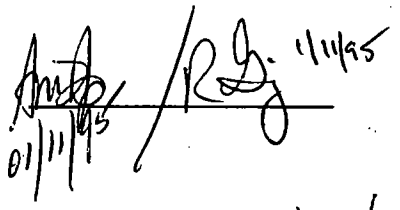
Joseph R. Franzmathes, Director
Waste Management Division
USEPA, Region IV

Concurrence Sign-Off Sheet:

AMERICAN CREOSOTE WORKS, INC.
Operable Unit One

FIVE-YEAR REVIEW

4WD-NSRB / 4ORC-CB
DEANGELO/GLAZE



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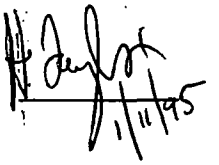

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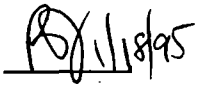

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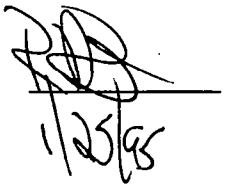
4WD
GREEN/FRANZMATHES



This Five-Year Review is for the Operable Unit One Remedial Action which began in 1989. The next Five-Year Review for the Site is scheduled to occur in 1999.

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1.0 INTRODUCTION

Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, (which implements Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)), requires five-year reviews "if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure." The five-year review requirement in the NCP applies only to Records of Decision (RODs) adopted after SARA (i.e., after October 16, 1986). Such reviews are referred to as "statutory reviews". Statutory reviews must continue at least every five years until contaminant levels allow for unlimited use and unrestricted exposure.

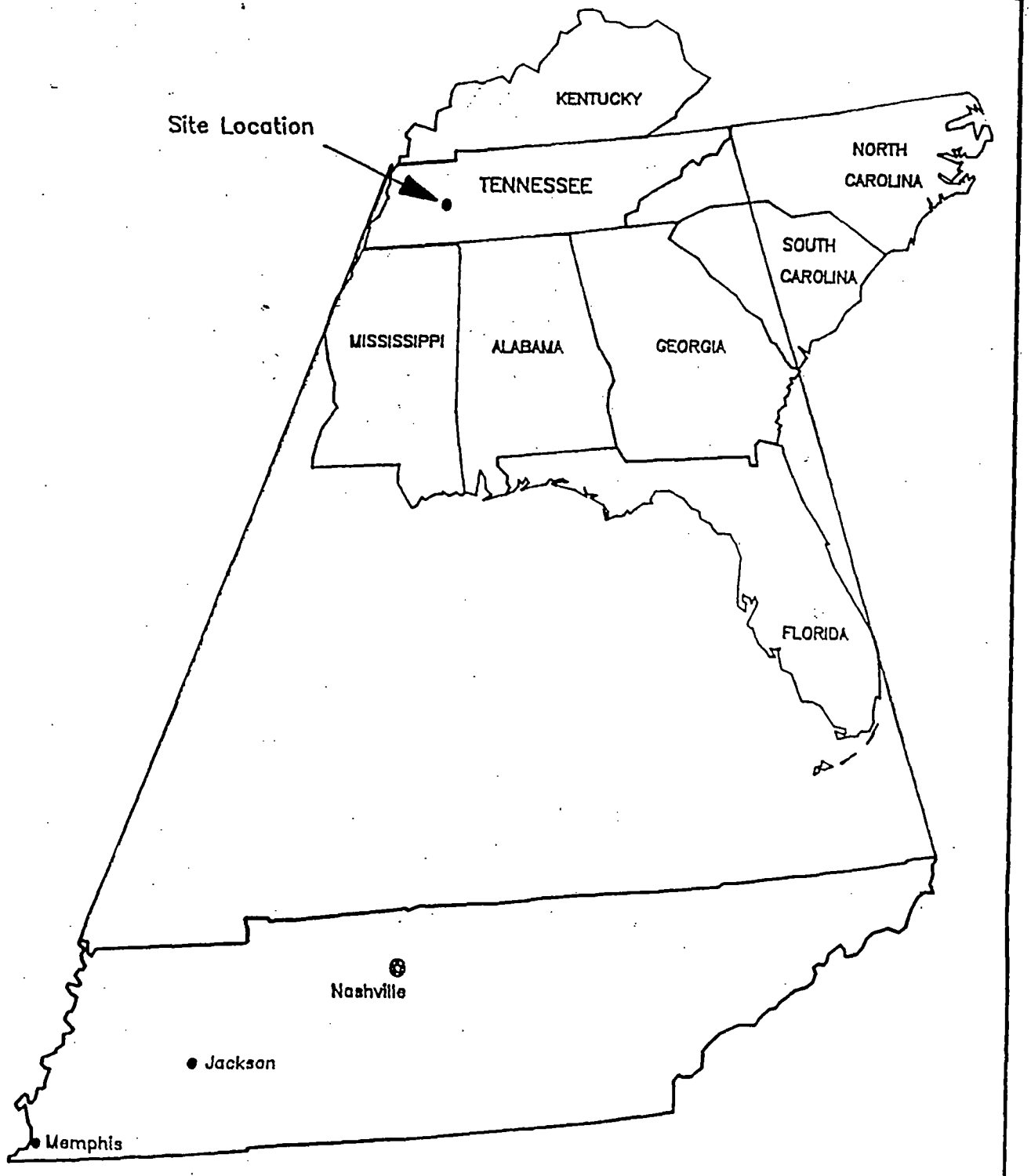
USEPA ("the Agency") has also committed to conducting certain discretionary reviews called "policy reviews". Policy reviews are five-year reviews at sites where reviews are not required by CERCLA or the NCP, but are conducted as a matter of Agency policy.

The Operable Unit One Remedial Action on-Site construction activities began in July 1989. The review is a statutory review in that contaminants remained on-Site after the Operable Unit One Remedial Action, which continued from the summer of 1989 until early in 1990. The Remedial Action was an interim action in which the process area surface structures were decontaminated, contaminated liquids and sludges were processed, metal tanks and other structures were demolished, and a significant portion of the scrapped metal and fixtures were salvaged. A gated 24-inch diameter metal drainage pipe was installed into the levee to facilitate drainage of on-Site lagoon water to the River. In two additional removals or interim actions in 1990 and 1991 more, but not all, scrap metal was salvaged, the Site was completely fenced, additional clay was applied to the surface of the capped lagoon area, and a large, submersed, electric pump was installed to move water from the on-Site lagoon to the River.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Site Location and Description.

The American Creosote Works, Inc. (ACW) CERCLA NPL Site is located in central Madison County, Tennessee, on the Jackson South 7-1/2 Minute Quadrangle (See Figures 1.0 and 1.1.). The Site covers approximately 60 acres southwest of downtown Jackson, Tennessee. The Site is bounded on the south by the Seaboard Railroad, on the southwest by the South Fork of the Forked Deer River, and on the east by a lumber mill (See Figure 1.2.). The general area is characterized by a gently rolling topography with wide, marshy flood plains. Maximum relief is on the order of



American Creosote Works, Inc.
CERCLA NPL Site
Jackson, Madison County, Tennessee
Figure 1.0

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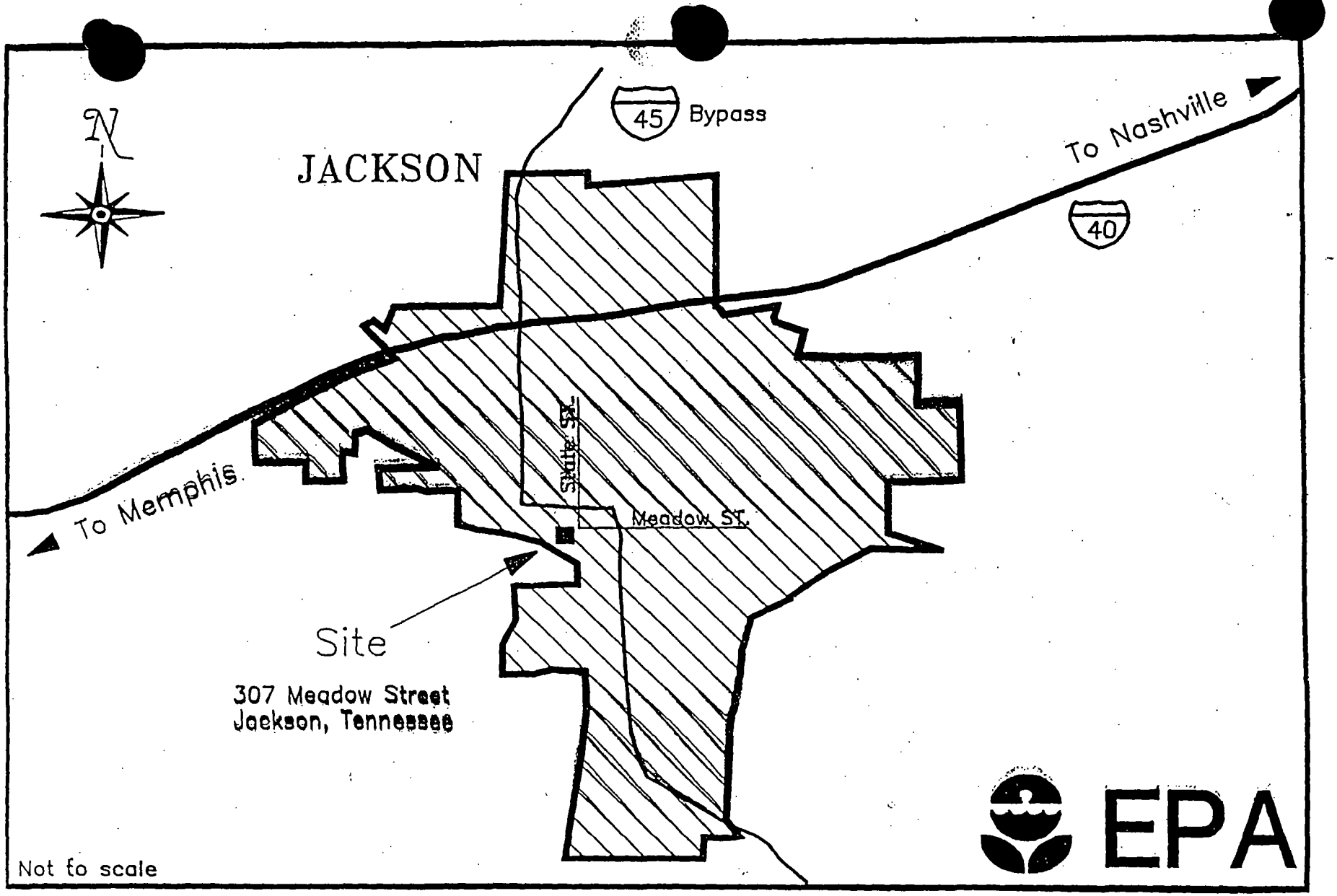
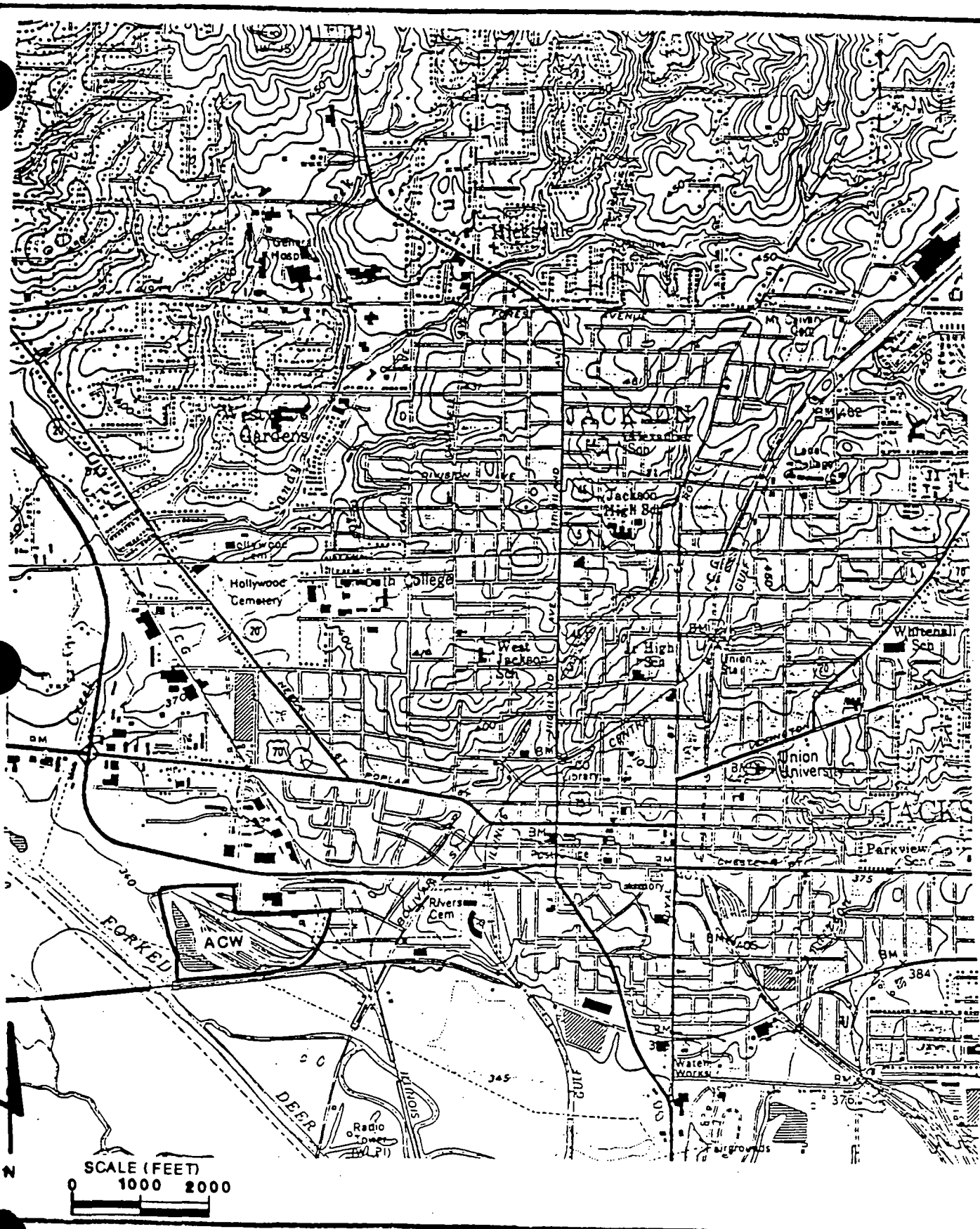


American Creosote Works, Inc.
CERCLA NPL Site
Jackson, Madison County, Tennessee
Figure 1.1



American Creosote Works, Inc.
CERCLA NPL Site
Jackson, Madison County, Tennessee
Figure 1.2

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100 feet (350 ft MSL to 450 ft MSL), with relief on the plant site of about 20 feet. The surface topography of the Site includes numerous small swales, five (5) remediated lagoons and other low lying areas (See Figure 2.0.). These low lying areas accumulate contaminated surface water and sediments.

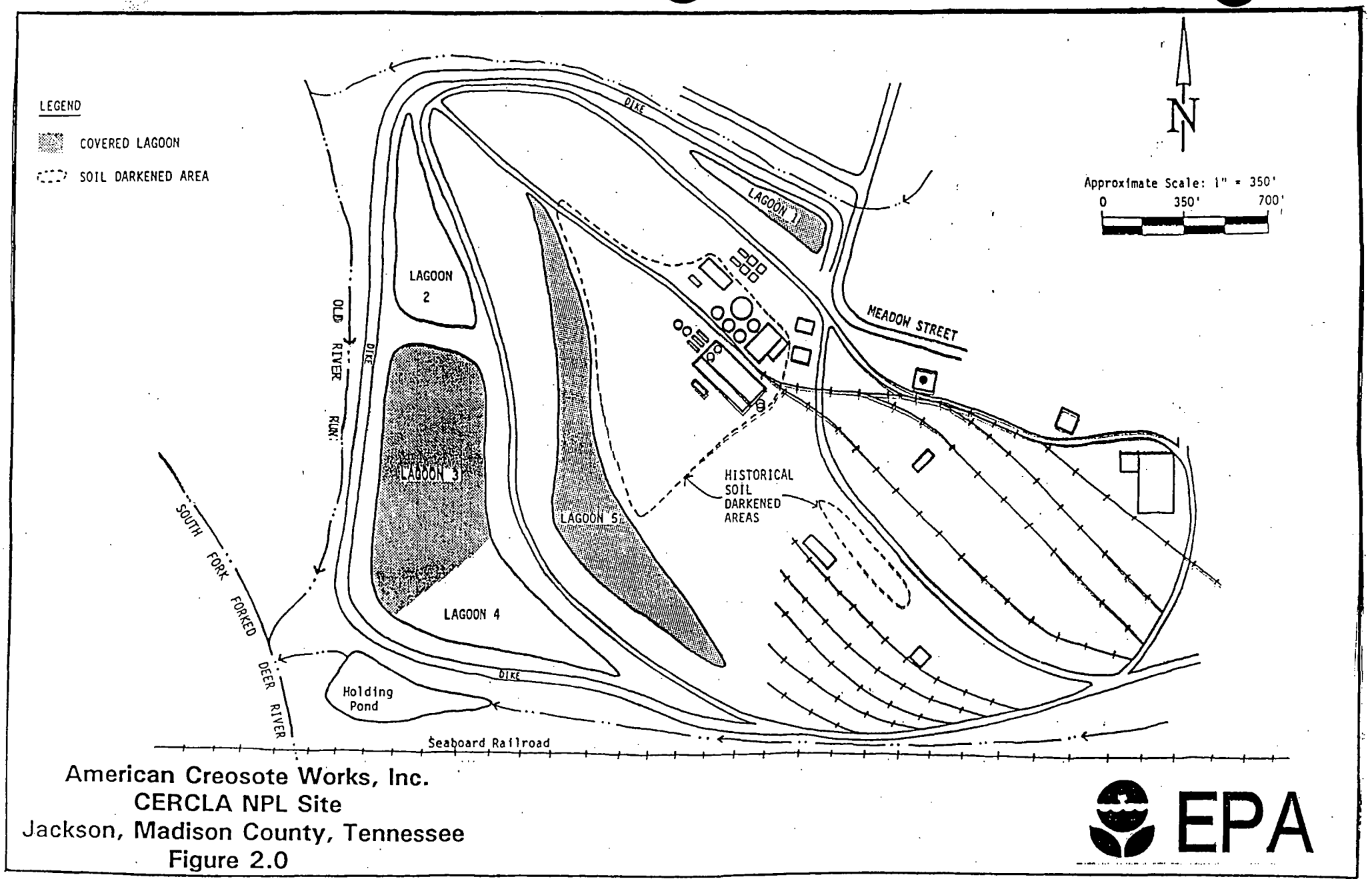
2.2 Lead and Support Agencies.

The USEPA has categorized the ACW Site as a Federal Fund-lead site, which means that the USEPA takes the lead for all Site remediation activities. Over the last several years, the State has participated in Site responses by means of Support Agency Cooperative Agreements (SACA) (40 CFR 35.6240 et seq.) which provide the State with ninety (90) percent of its management and response costs up to a given ceiling (CERCLA Section 104(c)(3)(C)). The Tennessee Department of Environment and Conservation (TDEC) has its Southwest Branch Office in the City of Jackson within three miles of the Site.

In March 1989 the State signed a Superfund State Contract (SSC) (40 CFR 35.6800 et seq.) with the USEPA to share the costs (90% federal/10% state) for the conduct of the Operable Unit One Remedial Action. Currently, the SSC remains in effect, and will continue to be viable until all the Operable Unit One Remedial Action costs are reconciled by both USEPA and the State, and Operable Unit One is closed-out, or modified by agreement between USEPA Region IV and the State of Tennessee.

2.3 Remediation Activities.

The original Operable Unit One Record of Decision was completed in January 1989. Immediately after the completion of the ROD, USEPA Region IV determined that a mix of Superfund emergency response and remedial authorities would be utilized to expedite the Remedial Design and Remedial Action processes. Some of the Remedial Design work was undertaken by Superfund emergency response contractors, TAT and ERCS, with USEPA Region IV oversight, and the rest of the Design tasks were completed under an Interagency Agreement (IAG) with the U.S. Army Corps of Engineers. The RD/RA work began in July 1989 and ended prematurely in January 1990 due to budget constraints and regulatory problems. All of the tasks which constituted the selected remedy were not completed as planned. Subsequently, two separate mobilizations by Region IV emergency response personnel occurred; one in 1991 and one in 1992. These two mobilizations resulted in the completion of those Remedial Action tasks, such as the installation of the perimeter security fence, which did the most towards the reduction of Site hazard and risk. Certain tasks required by the ROD remedy remain to be accomplished. These remaining tasks include the razing of buildings in the eastern portion of the Site and concrete structures in the process area, and the disposal of construction debris into a permitted construction debris landfill; salvage of scrap metal from the dismantling of the process area tanks and structures; and imposition of land-use and ground water use restrictions. An April



American Creosote Works, Inc.
CERCLA NPL Site
Jackson, Madison County, Tennessee
Figure 2.0

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1993 Support Agency Cooperative Agreement (SACA) for Site Stabilization, as described in the Operable Unit One SSC and alluded to in the original ROD, provides the State with funding for five (5) years of management of site stabilization activities, which include monitoring of lagoon water quality, repair of the site drainage system, and maintenance of the perimeter security fence. The September 1993 ESD explains the differences, and reasons for those differences, between the original ROD selected remedy and the remedy as implemented.

3.0 SUMMARY OF RESPONSE ACTION SELECTED

The ROD, issued on January 5, 1989, described the selected remedy as follows:

> "This operable unit will initiate action at the site while additional information is developed and evaluated. The selected remedy includes:
>
> * deed restrictions limiting further use of the site
> * construction of flood protection dike around the site and site stabilization
> * removal and disposal of tanked liquids and sludges
> * removal and disposal of site structures
> * installation of security fencing around the site
>
> This operable unit includes: treatment of the water contained in the tanks; incineration of the oils and sludges from the tanks; decontamination, demolition and disposal of the tanks; and consolidation and incineration of sludges (spilled or leaked) in the immediate vicinity of the buildings and tanks. Water from the tanks will be treated on-site utililizing a sand filter, filter press and carbon adsorption unit. Treated water will be analyzed to document treatment efficiency and discharged to the South Fork Forked Deer River or Central Creek. The oil and sludges from the site will be incinerated off-site at a fixed facility or on-site in a mobile incinerator if an off-site facility is unable to dispose of the waste. The site structures (buildings, tanks, pipes) will be decontaminated and disposed off-site at a Subtitle D facility to be selected in consultation with the Tennessee Department of Environment and Conservation. Uncontaminated or decontaminated salvageable materials will be sold if possible to a scrap dealer or recycler.
>
> Phase II of this remediation is intended to remediate more areas of the site by constructing a fence around the site boundary to deter access to casual visitors and to construct flood-protection

diking. This option may be implemented concurrent with or subsequent to Phase I. Removal of non-process area structures and other incidental construction is not planned during either phase, but will be addressed as part of the final remedy. Site stabilization pending a final remedy will include monitoring water levels on-site behind the dikes and pumping, treatment (as needed) and discharge of impounded water.

Remediation of the surface soils is not planned during either phase since bench- or pilot-scale testing is needed to verify that the technologies discussed in the FS report are applicable to site conditions."

The implementation of the Operable Unit One ROD Remedy was conducted by the USEPA Region IV Emergency Response and Removal Branch, using the Emergency Response Cleanup Services (ERCS) contractor, O.H. Materials, Inc. After arrangements had been made for the off-Site disposal of the creosote-bearing sludges and oils, as well as the design of the on-Site treatment machinery to process the creosotic wastewaters, USEPA, ERCS, and Technical Assistance Team (TAT) mobilized at the Site in July, 1989. A description of the remediation accomplishments follows.

4.0 SUMMARY OF RESPONSE ACTION PERFORMED

Operable Unit One activities consist of a Remedial Investigation/Feasibility Study, a Record of Decision (ROD), and certain remedial activities. Operable Unit One is comprised of those remedial activities which focused on the remediation of the facility process area and the levee/lagoons areas. Operable Unit One activities ended with the issuance of an ESD (09/17/93) which documents changes to the ROD which were not substantial. Monitoring of ground water and surface water will continue for the next five years (1993 - 1998). Operable Unit One does not address ground water or surface water problems. Ground water and surface water are addressed by Operable Unit Two. Operable Unit Three will address all remaining soil contamination and the buried sludges which are under water ("the lagoon"), or in the saturated zone, for most of the year, as well as other activities such as the razing of several old buildings.

The Operable Unit One Remedial Investigation, which was arranged for through an Interagency Agreement (IAG) with the U.S. Army Corps of Engineers (USACE) and was accomplished by a government contractor under USACE management, identified general areas of contamination, but was not of sufficient scope to thoroughly define the extent of the contamination in soil, groundwater or surface water. The Feasibility Study identified these three local media as the principal threats posed by the Site. Data gaps were significant enough that a final remedy for all of these media could not be selected at that time. Therefore, it was decided that these media would addressed

in Operable Units Two and Three after further investigation. Implementation of a phased approach was selected in order to mitigate the risk of human and environmental exposure through the use of proven technologies in a manner consistent with a more encompassing, permanent remedy. The potential for direct exposure to surface contamination resulting from degradation of the tanks and Site structures and the potential for the increased spread of contamination due to flooding was minimized while additional information was developed and analyzed. The remedial action for Operable Unit One disposed of process liquids and sludges (an estimated 500,000 gallons of contaminated water, 25,000 gallons of oil, and 115,000 gallons of sludge) which were in on-Site containers, demolished and disposed of the process buildings and storage tanks, isolated the Site with perimeter fencing, and built flood control structures.

The implementation of the Operable Unit One ROD Remedy was conducted by the USEPA Region IV Emergency Response and Removal Branch, using the Emergency Response Cleanup Services (ERCS) contractor, O.H. Materials, Inc. After arrangements had been made for the off-Site disposal of the creosote-bearing sludges and oils, as well as the design of the on-Site treatment machinery to process the creosotic wastewaters, USEPA, ERCS, and Technical Assistance Team (TAT) mobilized at the Site in July, 1989. A description of the remediation accomplishments follows in Sections 4.1 through 4.10.

4.1 Pumping of Sludges from Tanks.

225,000 gallons of creosote sludge left in fifteen (15) above-ground storage tanks remaining after plant operations ceased in 1981 were dewatered and disposed of.

4.2 Filtration and Dewatering of Tank Sludges.

The purpose of dewatering the sludge was to produce a dry waste stream that was easily transported by truck to a permitted, fixed incineration unit in Deer Park, Texas, for final treatment and disposal. Pressurized filtration was the process selected for dewatering the creosote sludge. The unit utilized in performing the process was a mobile plate and frame filter press. Chemical conditioning aids were used to pre-treat the creosote sludge before it entered the filter press. The net effect was the thickening or coagulation of the solid particles that aided in reforming the sludge so that it could be dewatered in the filter press. Following discharge, the sludge cake was stockpiled to await transportation and disposal.

4.3 Oil/Water Separation/De-emulsification of Effluent from Dewatering of Tank Sludges.

Effluent from the filter press was sent to a 50,000 gallon pool to await further treatment. Once a sufficient amount of oil had settled to the top of the pool, it was

pumped off to a 7,000 gallon tanker through an in-line cartridge filter which removed any residual solids. Once in the tanker, the oil was transported to an incinerator for final disposal. Accumulated water was pumped from the bottom of the 50,000 gallon pool to a 10,000 gallon box clarifier using a submersible pump. Effluent water from the clarifier was sent to a 10,000 gallon pool to await the next step in the treatment process.

4.4 Metals Precipitation from Effluent from Dewatering of Sludges.

At this point in the treatment system, the water was generally oil-free, but occasionally 10 to 20 parts per million (ppm) ECA-4FC de-emulsifier was added to the 10,000 gallon pool to break any residual emulsions. The next step in the treatment process was the precipitation of the metals and other solids in solution. The 10,000 gallon pool served as an influent sump for the separator.

4.5 Filtration of Suspended Solids.

Filtration was performed in a two step process that resulted in a reduction of the total suspended solids (TSS) of the effluent water stream. Water was pumped from the filter press effluent pool to a multimedia sand filter housed in a pressurized vessel.

4.6 Adsorption Utilizing Activated Carbon Beds.

Adsorption is the physical adhesion of molecules or colloids to the surfaces of a solid, an adsorbent, without chemical reaction. In some respects, adsorption is similar to coagulation and flocculation. One distinction is that adsorption generally uses an adsorbent solid processed especially for water treatment. In coagulation and flocculation, the adsorbent is produced in situ by reaction of a chemical, such as alum with water. The adsorption media used in the ACW water treatment system was activated carbon. After carbon adsorption treatment, the water was held in a 12,000 gallon pool for sampling and analysis prior to discharge to Central Creek.

4.7 Discharge Limits and Effluent Water Analyses.

Consistent with the ROD, USEPA and TDHE (TDEC) determined that effluent wastewater could be discharged into Central Creek, which borders the Site on the westernmost side. On May 9, 1989, the Tennessee Department of Water Pollution Control released their discharge criteria for discharge into Central Creek and the South Fork of the Forked Deer River. Central Creek is a zero flow, ephemeral stream that convolutes with the South Fork of the Forked Deer River at the southwest corner of the Site. Discharge criteria and statistics for the Creek and the River differ due to the variable rates of flow in each. Discharge criteria for Central Creek and the South Fork of the Forked Deer River are summarized in the Remedial Action Report, dated 1989, Attachment G, Water Discharge Report. Effluent water analyses are summarized in

chronological order in Attachment H, Analytical Results, of the same report.

4.8 Transportation and Disposal of Waste Streams.

Remedial actions at the American Creosote Works Site resulted in the generation of a number of different waste streams. RCRA K001 wastes were generated by the dewatering of creosote sludge, the solidifying of bulk creosote sands, and the removal of creosote oils. Several drums of asbestos from piping insulation were shipped to a permitted landfill for disposal. The contents of a Site laboratory were lab-packed and sent for disposal. The filter cake, oils, and sand filters, all classified as K001 wastes, were shipped in bulk containers to a fixed facility incineration unit in Deer Park, Texas. Creosote filter cake was shipped in containers sized to hold approximately twenty cubic yards of material. Bulk creosote sand material was also shipped in dump trailers that typically held 40,000-45,000 pounds of material. Creosote oils were shipped in 7,000-gallon tankers. A complete summary of manifest information including weights, transportation charges, and estimated disposal costs can be found in the Removal Action Report, dated 1989, Attachment J, Transportation and Disposal Table.

4.9 Building Demolition.

After Site start-up, building demolition became an integral part of the remedial action. Demolition of the main process building facilitated access to two 100,000 gallon tanks and the pressure treatment vessels. Most of the process equipment, boilers, pumps, compressors, etc. were salvaged and set aside for recycling. Demolition was accomplished utilizing a hydraulic shear mounted on a trackhoe, which allowed for cold cutting of metals, thus significantly reducing the chances of fire hazards. Once the storage tanks were emptied of their contents, the shears were used to dismantle them and set the scrap metal aside for decontamination at a later date. Decontaminated scrap metal and rubble from building demolition were stockpiled near the front gate of the Site in order to facilitate pickup and disposal or recycling. The wooden buildings in the eastern part of the Site have yet to be demolished.

4.10 Levee Improvements.

USEPA contracted with the U.S. Army Corps of Engineers (USACE) to design an upgraded drainage system to improve the drainage of the cap area which is surrounded by a levee in the southwest corner of the Site. The cap overlies more than10,000 cubic yards of stabilized creosote sludge. Since the ground water table was so high in this area, drainage control was necessary to prevent further migration of the contaminants from the Site or into the ground water as well as to slow the cap degradation. USEPA/USACE performed the installation as follows:

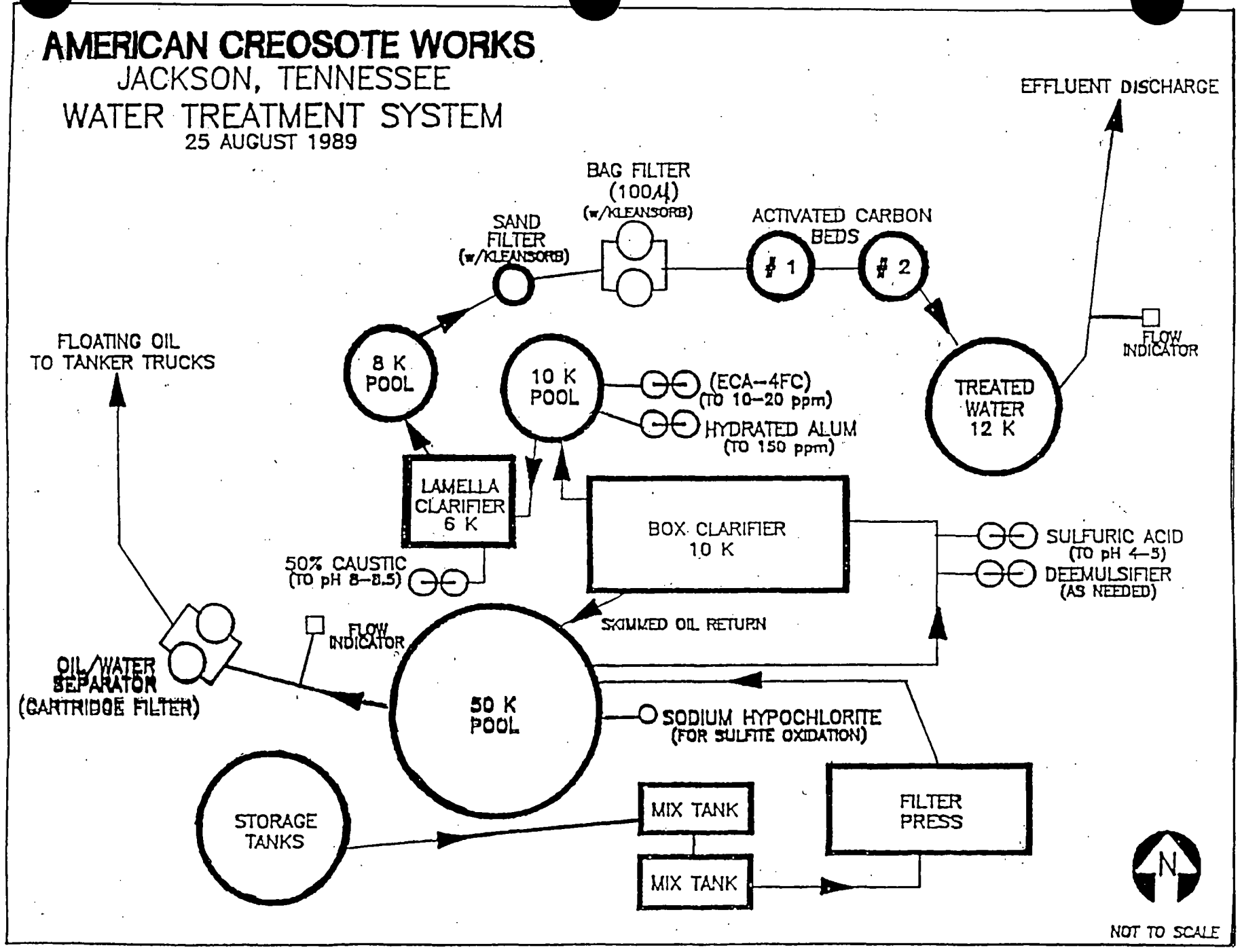

Figure 3.0

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(a) Excavated the levee to allow placement of an effluent pipe, and excavated an additional 700 linear feet of ditching to the River;
(b) Installed 72 feet of 24-inch diameter corrugated metal pipe constructed of polymer-coated, 16-gauge, spiral, galvanized steel through the levee;
(c) Lined the contours of the drainage pipe ditch, which runs to the River, with geotextile fabric and rip-rap;
(d) Installed a spigot-back sluice gate to the end of the pipe located within the levee area; and
(e) Constructed a walkway from the levee to the sluice gate with pressure-treated lumber.

5.0 DESCRIPTION OF POST-RESPONSE ACTION ACTIVITIES

5.1 Remedial Action in 1991.

5.1.1 Introduction.

Shortly after the work was completed in the summer of 1990, it became obvious that the drainage system, a part of the flood protection dike required by the ROD and installed during the remedial action, could not be made to operate properly. There were five basic problems with the drainage system.

a. On the landfill side of the levee the bottom of the 24-inch drainage line sat at least two feet above the capped sludge lagoon. This meant that even when the sluice gate was open, two to four feet of water would stand on the landfill cap, thus forming a freshwater lagoon having a volume of several million gallons.

b. The discharge side of the 24-inch pipe sat low enough in the floodplain of the River that, with any significant rainfall, it would be submerged. This problem was exacerbated by the fact that the slope of the drainage line was fairly slight. As a result, whenever the South Fork of the Forked Deer River would overflow its banks, the water level on the discharge side of the pipe would be higher than the lagoon side. At those times when drainage was needed most, the sluice gate could not be opened, lest water flowed from the River to the landfill. In fact, the gate could not be opened until several days after a significant rain event occurred.

c. The landfill cap had apparently settled unevenly, resulting in three large depressions. These areas would form large puddles several feet deep and would not drain toward the 24-inch drainage pipe.

d. The compacted clay material which was used to seal the outer annulus of the 24-inch line was insufficient to prevent leakage. This allowed a sizable flow of water along the outside of the pipe back onto the landfill whenever the water level on the

discharge side was high.

e. The sluice gate had to be opened manually. This required personnel from the Tennessee Department of Environment and Conservation (TDEC), Division of Superfund, to make frequent time-consuming visits to the Site. It was impractical for TDEC personnel to make an inspection of the water level after each local rainfall event. TDEC expressed dissatisfaction with the design, and requested that an automatic discharge system be considered.

Because of the problems with the drainage system, the USEPA Region IV Remedial Program requested the Emergency Response and Removal Program (ERRB) to design and install a replacement drainage control system in December 1990. The design selected by the On-Scene-Coordinator (OSC) was comprised of a submersible, five (5) horsepower pump, which would be installed in a drainage sump near the 24-inch drainage pipe. In addition, the landfill cap would be regraded to drain more efficiently toward the collection sump.

Two more items were planned for this remedial action. The first was to regrade and reseed the old facility process area, since a grass stand had not developed in that area. The second was to extend the fence that already existed on the eastern side of the Site between the old pole storage area and the lumber yard next door.

5.1.2 Remedial Action Summary.

On June 5, 1991, USEPA, TAT, and the ERCS contractor, O.H. Materials (OHM), mobilized at the Site to begin the stabilization actions called for in the ROD. The first task undertaken was to remove the standing water from the landfill cap. This was done by pumping the water over the levee into the South Fork of the Forked Deer River. The dewatering of the landfill area actually proved to be the most difficult and time-consuming aspect of the action for two reasons. First, extra pumps had to be mobilized to drain the existing water to the River. Second, there were several high rainfall events during the initial days of the mobilization. Heavy rainfall extended the response period more than thirty (30) days beyond the original schedule for the entire response.

After the area inside the levee was finally dewatered, and dry enough to allow for equipment operations, the cap regrading and sump pump installation went smoothly. The pump was installed in the southeastern corner of the lagoon area. The pump was equipped with an automatic float switch, which was tested for proper functioning.

Scrap metal and debris were cleared from the old process area in order to regrade and reseed that area. Originally, the material was to be collected for hauling to an off-Site scrap dealer. Prior to doing this, the USEPA contacted a businessman who had purchased certain salvageable equipment and scrap metal from American Creosote

Works, Inc. just prior to its filing for bankruptcy. With USEPA approval, the businessman had removed some scrap material, as well as some process tanks and a treatment cylinder from the Site, during earlier removal actions. After discussions with USEPA Region IV's Office of the Regional Counsel, the businessman agreed to sign an indemnification agreement and to conduct the salvage work at his own expense, but only under the oversight of the USEPA representative. Approximately fifteen twenty-cubic-yard truckloads of scrap metal were removed from the old process area. In addition, the businessman's crew removed three large process tanks. The USEPA arranged for clean fill cover material to be brought into the process area and the surface was regraded and seeded.

The last task planned for the 1991 remedial action was the extension of the fence on the eastern border of the Site. Keeping trespassers off of the Site during the removal action was difficult. Consequently, the USEPA contractor installed a six foot (eight foot in places) fence around the entire Site perimeter.

5.1.3 Remedial Action in 1992.

During November 1991, the TDEC Project Manager in Jackson, Tennessee, noted that the sump pump was not working properly and notified the USEPA RPM. Due to USEPA regulatory and budget constraints, and weather delays, USEPA contractors were not mobilized until March, 1992. Ponded water was pumped from the landfill side of the levee to the River after sampling and analysis of the water had been completed. The removal of the ponded water was necessary in order to remove the sump pump for repair. The pump was repaired and reinstalled.

5.1.4 Differences Between the Response Action Selected and the Response Action Performed.

A task by task comparison of what the ROD required and what was actually accomplished follows:

a) **REQUIRED BY THE ROD:** Deed restrictions limiting further use of the Site.

ACTUAL ACCOMPLISHMENT: Deed restrictions have not been arranged. The property is completely fenced off and warning signs are posted, which will provide notice to prospective purchasers who visit the Site.

b) **REQUIRED BY THE ROD:** Construction of a flood protection levee around the Site and conduct of Site stabilization tasks.

ACTUAL ACCOMPLISHMENT: The major portion of the levee was constructed prior to the signing of the January 1989 ROD. However, the TDEC, by means of a cooperative agreement with the USEPA, completed the levee and the levee road bed

repairs in 1990 utilizing its own contractor. The 24-inch corrugated metal drainage pipe, with sluice gate and control platform, was installed during the 1989 Remedial Action by USEPA's ERCS contractor, O.H. Materials, Inc., according to a U.S. Army Corps of Engineers design.

However, Site stabilization activities are outlined in a "Site Stabilization Plan" (SSP), which was alluded to in Section 15 of the Superfund State Contract (SSC) for the Operable Unit One Remedial Action. The Site Stabilization Plan was designed to be implemented under the provisions of a separate Support Agency Cooperative Agreement (SACA) which was awarded to the State of Tennessee on April 29, 1993. The SSP does not describe operable unit-specific operation and maintenance (O & M) activities, but provides a plan for general Site housekeeping tasks which are to be conducted by the State through April 1998.

c) **REQUIRED BY THE ROD:** Removal and disposal of tanked liquids and sludges.

ACTUAL ACCOMPLISHMENT: The tanked liquids and sludges from the old process area were accumulated, treated on-Site, and the contaminated constituents resulting from treatment taken off-Site for incineration in the 1989 Remedial Action by USEPA.

d) **REQUIRED BY THE ROD:** Removal and disposal of Site structures.

ACTUAL ACCOMPLISHMENT: Most of the Site/facility structures have been dismantled or demolished. The only structures left standing in the old process area are the partially demolished reinforced concrete walls of the sand filter, the concrete vacuum pool and a small shed next to it. All sixteen empty and decontaminated metal tanks were either dismantled using a hydraulic shear and stockpiled on-Site for future salvage or left intact for recycling. There are several piles of scrap metal and construction debris proximal to the old process area. Complete demolition of remaining structures and disposal of the debris was not feasible in the first Operable Unit and USEPA determined that, due to the restricted Site access, immediate removal was not needed to ensure protectiveness. Removal of the debris will be addressed in subsequent Operable Units, as necessary. East of the old process area the old facility office remains. It is a building which is overgrown with vegetation and is no longer useable. The two wooden buildings, which USEPA determined posed no environmental risk, in the northeast corner of the Site next to the adjacent lumber company, are still standing, but in a state of disrepair. Razing these structures is not necessary to insure protectiveness.

Virtually all railroad rails and ties have been salvaged. Almost all other small buildings, pipes, and pads have been demolished and/or salvaged.

e) **REQUIRED BY THE ROD:** Installation of security fencing around the Site.

ACTUAL ACCOMPLISHMENT: Prior to 1989, an eight foot high, chain-link fence was installed across the front of the facility. Keeping the trespassers off of the Site during the 1989, 1990, and 1991 removals action was difficult. Consequently, a six foot high (in some places eight foot) chain-link, security fence was installed around the entire Site perimeter. Maintenance and repair of the perimeter security fence for the next five years is provided for in the Site Stabilization Plan.

5.1.5 Site Stabilization Activities.

USEPA determined that the "Site Stabilization" activities described in the Operable Unit One Superfund-State Contract (SSC), dated May 1989, and in the Support Agency Cooperative Agreement (SACA), awarded April 29, 1993, would include the following tasks which are necessary to the general housekeeping of the Site, but were not all required by the ROD.

(a) Sump pump repair and maintenance (Installation of an electric sump pump was not anticipated by the ROD.);

(b) Management, administration, payment of electric bill;

(c) Repair and maintenance of 24-inch diameter discharge pipe, sluice gate, and sluice gate operation platform (Installation of a large diameter drainage pipe was not anticipated by the ROD.);

(d) Maintain perimeter fence, gates, and warning signs;

(e) Maintain the levee and the perimeter road;

(f) Sample the lagoon water periodically and before discharge to the River; and

(g) Keep vegetation inside the perimeter fence under control by mowing and trimming; and by repairing erosion damage and re-seeding the grass cover where necessary.

The above-described tasks are not considered Operation and Maintenance (O & M) in the strict sense of the concept. The Site Stabilization activities are set forth in a Site Stabilization Plan (SSP) which effectively covers all three (3) phases or operable units of the total Site remediation. The SSP is to be considered separate and distinct from any O & M plan that is associated with a specific operable unit or phase of the Site remediation.

6.0 SCOPE AND NATURE OF FIVE-YEAR REVIEW

6.1 Document Review.

6.1.1 Background Information.

Certain Site file information was reviewed and referenced herein. The documents reviewed included the January 1989 ROD, the SSC, the 1989 Removal Action Report, the 1991 Removal Action Report, the September 1993 Operable Unit One Explanation of Significant Differences, and the September 1993 Operable Unit One Remedial Action Report (i.e., Close-Out Report). These documents compose the major milestone documents for the Operable Unit One activities. Other documents were consulted in the process of conducting the associated activities under Operable Units Two and Three. The file documents which were consulted are listed in the REFERENCES at the end of this document.

6.1.2 Design Review.

There was a conceptual design or list of remedial action tasks to be performed during the actual Remedial Action construction; however, detailed design drawings and a comprehensive set of specifications were not drawn up ahead of time. The details of the dismantling of the process area machinery, storage tanks, etc. were worked out as the activities proceeded. The treatment of the process tank wastes and the contaminated lagoon water was also accomplished by experimentation. The levee improvements and the installation of the 24" diameter corrugated metal drainage pipe, and its fixtures, were done according to designs produced by the U.S. Army Corps of Engineers. Additional removal/remedial action construction work in 1991 and 1992 was accomplished according to a list of tasks to be performed and not pursuant to a set of detailed design drawings and specifications. However, all activities, construction, and salvage were well-documented.

6.1.3 Maintenance and Monitoring.

Maintenance and monitoring has occurred through the mechanisms of Support Agency Cooperative Agreements (SACA's) or Management Agency Cooperative Agreements (MACA's) since at least 1987. These agreements allowed the local Jackson, Tennessee, branch office of the THEC (now TDEC) to undertake certain management activities at the Site, which is within the City of Jackson proper, and to share those costs with the Agency according to either a 90%/10% split or to no split, wherein the Agency reimbursed the TDEC for 100% of its documented costs up to a certain ceiling. The most recent SACA, herein listed as a reference, is for Site Stabilization activities as described in the Superfund State Contract (SSC). The SACA is for a five year period ending in April 1998 and dictates a 90%/10% cost-sharing mechanism between USEPA and the TDEC. The SSC remains viable, and will be until all Operable Unit One Remedial Action costs are accounted for by both USEPA and the TDEC. Meanwhile, the TDEC, under the SACA, is charged with maintaining the Site according to a Site Stabilization Plan agreed to by both the USEPA and the TDEC.

6.2 Standards (ARARs) Review.

6.2.1 Background Information.

The applicable or relevant and appropriate requirements (ARARs) for the Operable Unit One remedy are listed in Table 1.0 of the original January 1989 Record of Decision which is reproduced below.

6.2.2 Changing Standards.

The September 1993 Explanation of Significant Differences (ESD) did not modify the ARARs, nor have the Operable Unit One ARARs been modified by any other activity or document.

6.2.3 Risk Assessment.

The Baseline Risk Assessment was initiated in 1987 and completed in 1988. It is Section 1.2.5 (p. 1-25) of the Final Feasibility Study Report. Since the 1988 Risk Assessment was accomplished after the 1983 Site-wide removal, but before the 1989 removal/remedial action, the risk at the Site would have been modified by several things: (1) the process machinery and leaking storage tanks have been dismantled and removed; (2) the process area has been covered with compacted clay; (3) since 1987, in the area of the Site, new commercial/business construction has occurred, but no residential construction has occurred; (4) the Jackson Utilities Department South Well Field withdrawal rate was reduced to half or less of its maximum withdrawal rate; (5) the Site was completely fenced (except for old lagoon # 1) in 1991; (6) further ground water investigations by the USGS from 1990-1993 indicate no significant off-Site ground water contamination; and (7) additional soil investigations in 1993 indicate significant, but nonmigrating, subsurface creosote contamination in two major on-Site areas.

6.3 Interviews

6.3.1 Background Information.

Regular contact is maintained with the TDEC's Branch Office in Jackson and meetings with the local City officials have occurred in conjunction with the Iselin Railyard Site, a separate CERCLA site which is a short distance southeast of the ACW Site. The general populace is not overly concerned with the ACW Site. They are more concerned with such things as environmental equity issues and with maintaining the

TABLE 1.0

ACTION	CITATION
Discharge of treatment system effluent	▸40 CFR 122.44(a) ▸40 CFR 122.44 ▸Water Quality Act, Tennessee Code Annotated (T.C.A.) Section 69-3-101 et seq. Rule Chapter 1200-4-3 ▸40 CFR 131
Protection of flood plains	▸40 CFR 6, Appendix
Fish and Wildlife Coordination Act (16 USC 661 et seq.)	▸40 CFR 6.302
Dike stabilization	▸40 CFR 264.221
Solid waste disposal	▸Solid Waste Disposal Contol Act, T.C.A. Section 68-31-101 et seq. Rule Chapter 1200-1-7
Off-site transport of hazardous wastes	▸Hazardous Waste Management Act. Part I T.C.A. Section 68-46-101 et seq. Rule Chapter 1200-1-11, 12 and 13. Part II T.C.A. Section 68-46-201 et seq. Rule Chapter 1200-1-11-14
On-site incineration of hazardous wastes	▸40 CFR 264
On-site incineration of hazardous wastes (in addition to the above)	▸Air Pollution Control Act. T.C.A. Section 68-25-101 et seq. Rule Chapter 1200-3-1

quality of their public drinking water, neither of which they associate with the Site.

6.3.2 Local Considerations.

The local citizenry have not been vocal about the Site. The TDEC Branch Office is located within the City of Jackson near the main interstate exchange. The TDEC is partially funded by the Agency to manage certain activities at the Site; those activities include the handling of citizen enquiries about the Site. However, Site-specific citizen complaints are minimal insofar as the Agency can determine.

6.3.3 Operational Problems.

The ponded water (the lagoon), which accumulates on the facility side of the levee, overlies several thousand cubic yards of buried, fixed creosote sludge. The presence of this fixed creosote sludge in the saturated zone is presumed to present a hazard to the ground water at the Site. In 1989-90 a 24-inch corrugated metal drainage pipe

(CMP) with a sluice gate was installed through the levee in order to drain ponded water from the facility side of the levee to the River side of the levee. Over a period of time the clay seal between the outside of the pipe and the levee decayed, probably due to excessive hydraulic differential, and water from the on-Site lagoon and from the River began to flow unrestricted from one side of the levee to another; thus the sluice gate would do little good. In 1991-1992 a large submersible sump pump was installed in a pit at the southeast corner of the lagoon. Electrical power connections were arranged and a maintenance schedule was created. Unfortunately the pump malfunctioned, even after several attempts at repair, and has been operating intermittently for most of its life. This situation has been a point of contention for relations between the TDEC and the Agency. The TDEC has been looking into the feasibility of demolishing the levee, the drainage pipe, and the sump pump and allowing the River to flow more naturally along the southern portion of the Site.

6.4 Inspection/Technology Review.

This section describes the results of recent inspections and examines the effectiveness of the technology utilized by the selected remedy and the thoroughness and implementation of the maintenance (Site Stabilization) plan.

6.4.1 Performance and Compliance.

The effects of the 1989-1990 and 1991-1992 removal/remedial actions have been permanent. The majority of the old process area surface has been cleared of process equipment. Presently, one partially dismantled treatment cylinder and several piles of salvageable scrap metal are visible, but no storage tanks or other above-ground process structures, except for a small storage building and the remains of reinforced concrete sand filters, remain. The five creosote sludge lagoons which existed before 1983 were filled in 1983; the creosote from four of the lagoons was consolidated into one lagoon near the River, and the creosote stabilized with lime and kiln dust and buried under a clay cap. A few railroad ties and rails remain in the middle of the Site; and three wooden buildings, which are in a state of disrepair, remain standing east of the old process area. Some areas on the facility and immediately outside of the perimeter fence are overgrown, but an agreement between the USEPA and the TDEC includes management authority and funding to trim those areas on a regular basis. The lagoon that forms in the western portion of the facility near the River at high water or after lengthy periods of rainfall is moderated by the drainage pipe under some conditions, i.e., generally when the level of the lagoon is higher than the level of the River. A perimeter fence of the chain-link variety, and varying in height from six to eight feet and having locking gates at strategic locations, was completed in 1991. Warning signs are plainly visible and the perimeter fence is maintained according to the Site Stabilization Plan implemented through the Support Agency Cooperative Agreement (SACA).

According to the USGS Hydrogeological Investigation (1990-1993), levels of organics in the ground water on-Site have moderated, and low levels in ground water off-Site are not able to be directly attributable to the Site. Ground water flow is towards the River from the City of Jackson. Surface run-off and ground water flowing from the direction of the City may contribute a significant portion of the ground water and surface water contamination near the River; the exact portion is difficult to determine.

6.4.2 Off-Site Considerations.

The Site immediately abuts the South Fork of the Forked Deer River, and almost one-half of the sixty (60) acre Site is in the one hundred (100) year flood plain. The prevailing surface water and ground water flows are from the City across and under the Site towards the River. In the area of the Site the River has low, only slightly sloping, wide banks which are swampy most of the year. From its opening until the early 1970's, the active ACW facility discharged its effluent either to the River or, later, to the on-Site lagoons. Later on, through 1979, the effluent was treated in sand filters before being discharged to the on-Site lagoons; flooding and surface run-off would have transported the lighter creosote constituents to Central Creek, the River, and the swampy areas downriver. During the USGS Hydrogeological Investigation (1990-1993) low concentrations of one, two, or three VOCs/SVOCs were detected in some off-Site ground water and sediment samples. The Investigation also concluded that there were other upgradient, non-Site-related sources of VOC/SVOC contamination detected in the swampy area downgradient from the Site.

The physical and chemical treatment of the untanked liquids and of the lagoon waters during the 1989-1990 removal/remedial action was thorough. State discharge criteria for pentachlorophenol and for metals and creosote constituents were met. Process sludges were mixed with tank sludges, and sludges from decontamination, and trucked to a prearranged off-Site incinerator for treatment and disposal. However, the ROD addressed neither the heavily contaminated soils under the process area nor the buried, fixed creosote sludges currently under the ponded area near the levee.

The City is upgradient of the Site. There are currently no detectable vaporous emissions from the Site. The City is not now effected by the potential ground water contamination or potential air contamination from the Site. Since the Site is completely fenced off and has warning signs posted, trespassers are unlikely to venture onto the facility to play or fish in the intermittent lagoon.

6.4.3 Recommendations.

Pursuant to the Agency's and the State's inspections, the two main concerns are: (1) the management of River flood water and surface run-off at the Site; and (2) the removal and treatment of the subsurface creosote/PCP soil contamination which is the main potential source of migratable contamination by means of ground water and

surface water.

6.5 Report.

6.5.1 Background.

The five-year review process was begun in the spring of 1994. Site files were reviewed and Site inspections were conducted. An especial focus was the part that the first Operable Unit played in the overall investigation and remediation of the Site. As previously mentioned, the Operable Unit which is the subject of this Five-Year Review is one of three remedial response phases currently underway. This Review demonstrates that significant permanent reductions in the Site total hazard and total risk were accomplished as a result of the remedial responses in 1989-90 and 1991-92; and that any remaining maintenance issues have been satisfactorily accommodated.

6.5.2 Site Conditions.

The current Site conditions are generally as described in section 6.4.1 herein. For a more up-to-date description of Site conditions one may contact the Jackson Field Office of the TDEC.

6.5.3 Risk Assessment.

6.5.3.1 Original Baseline Risk Assessment (October 1988).

Utilizing five chemicals of highest concern (i.e., benzene, hexachlorodibenzodioxin, pentachlorophenol, tetrachlorophenol, and total carcinogenic PAHs) the original risk assessment concluded that the total Site risks were in the chances per thousand to chances per hundred range. Table 1-15 (p. 1-73) in the Final Feasibility Study (October 1988) describes and summarizes the total Site risks prior to the USEPA 1989-90 remedial action.

6.5.3.2 The Focused Risk Assessment.

In November 1994 USEPA Region IV contracted for a risk assessment which focused upon the surface soils at the Site. Other media were not to be directly considered since the purpose of the Focused Risk Assessment was to provide Region IV with enough support to construct an Interim Record of Decision which would lead to a limited remedial action in the two main areas of heavy contamination, the old process area and in the old lagoon area. The Focused Risk Assessment is scheduled for completion in the spring of 1995. A Record of Decision is expected to be finalized before the end of September 1995.

6.5.4 Recommendations.

The Focused Risk Assessment, which is due to be completed in the spring of CY 1995, is expected to demonstrate a reduced risk due to surface contamination. The subsequent completion of a ROD allowing for limited remedial action is recommended and expected. The implementation of the remedy to be selected in the next ROD would further decrease certain Site risks.

7.0 RESULTS AND RECOMMENDATIONS OF FIVE-YEAR REVIEW

7.1 Results of Review.

7.1.1 Contamination Migration.

Major contamination migration has not been detected. Low levels of PAH and PCP derivatives continue to be found in the ground water and surface water on-Site. Potential contamination migration due to the large volume of fixed/solidified creosote sludges buried during the USEPA 1983-84 emergency response activity has not been realized. Subsequent to the removal/remedial actions in 1983-84, 1989-90, and 1991-92, major contamination migration events do not appear to have occurred because of the local geology as well as the effectiveness of the remedial responses.

7.1.2 Major Risks.

Major risks are from dermal exposure to creosote/PCP-contaminated surface soils and from inhalation of surface soil dusts. An off-Site ground water problem due to on-Site contamination has not been documented; the Jackson Utility Department's South Well Field, which is more than a mile southeast of the Site, has not been affected. Rain water accumulating in low areas in the southern portion of the Site is contaminated with very low concentrations of PCP and PAH derivatives which most likely migrate from surface soils and shallow surface soils; however, surface waters are not utilized for household uses. Swimming and fishing in the lagoons on-Site is prohibited and access to the Site is denied by a perimeter fence and warning signs.

7.1.3 State/USEPA SACA for Site Stabilization.

The State/USEPA Support Agency Cooperative Agreement (SACA) for Site Stabilization, Site maintenance, and management was initiated in April 1993 and expires in April 1998.

RELEASE SOURCE ANALYSIS FOR RISK ASSESSMENT

RELEASE MEDIUM	POTENTIAL RELEASE SOURCE	RELEASE MECHANISM	RELEASE TIMEFRAME	RELEASE PROBABILITY/AMOUNT	FIVE-YEAR REVIEW COMMENTS
AIR	contaminated surface soils	volatilization and/or fugitive dusts	chronic	high probability of chemical release, the mass amounts released are probably very low	process area and sludge lagoons have been capped; rest of Site is mostly vegetated; air releases are insignificant
SURFACE WATER	surface run-off from contaminated surface soils	overflow & runoff	sporadic	high probability of some chemical release, but the mass amounts released probably range from low to very low amounts	surface runoff flows over capped and vegetated areas; chemical releases subject to moderation and dilution; process area no longer subject to spills and leaks; lagoon waters tested for contamination
GROUND WATER	contributions made by contaminated soils and the plant process facility	desorption by precipitation	chronic	100% probability, but the mass amounts released potentially range from low to very low amounts	USGS Hydrogeological Investigation indicates very low leach rates from buried, fixed sludges and from process area subsurface soils; lenses of consolidated soil mitigate transport
SOIL	leachate or surface run-off from the plant process facility	desorption by precipitation	chronic	100% probability, the mass amount released is probably low for surface soils to very low for subsurface soils	leachate and surface run-off from process facility have been mitigated by results of cleanup activities; amounts released to surface and subsurface soils are very, very low, but detectable
NAPL *	contributions made by contaminated soils and the plant process facility	desorption by precipitation	chronic	100% probability, but the mass amounts released potentially range from low to very low amounts	process plant dismantled; spills and leaks no longer occur; surface soils capped; most contaminated soils are subsurface; increased vegetation moderates desorption by precipitation

* Non-Aqueous Phase Liquid

7.2 Recommendations.

7.2.1 Reconciliation of the SSC.

Reconciliation of the Superfund-State Contract (SSC) accounting for the Operable Unit One Remedial Action is underway as of November 1994.

7.2.2 Assured Continuation of Maintenance of Site.

Re-ascertain that there is enough funding at both Federal and State levels to carry on with the Support Agency Cooperative Agreement (SACA) through the end date of April 1998, so that there is assurance that local management of the Site will continue unabated.

7.2.3 Future Remedial Actions.

The completion of a 1995 Record of Decision which describes a remedial action in the old process area and/or the buried sludge area would be followed, under current law, by a remedial design and the implementation of that design under the terms of either a new Superfund-State Contract (SSC) or under a modified version of the existing SSC. At present USEPA Region IV estimates that, because of projected funding constraints, more than one remedial action will be necessary to complete the remediation of the Site. Current Site conditions allow the USEPA and the State time for consideration of clean-up options.

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